

Patent Claims

1. Device for the separation of plastic cards, especially chip cards, from a sheet or strip material, with an upper and lower cutting tool defining the cutting outline which are designed to cut into a corresponding upper and lower side of the sheet or strip material, while retaining a residual cross-piece,
characterized in that at least two upper and at least two lower cutting tools assigned in each case next to each other are provided for the forcibly coupled separation of several plastic cards.
2. Device according to Claim 1,
characterized in that between an upper and a lower cutting tool a fixing device for the positioning and holding of the sheet or strip material is provided at least during the cutting process.
3. Device according to Claim 2,
characterized in that the fixing device consists of an upper and a lower guide frame element.
4. Device according to Claim 3,
characterized in that the guide frame elements of at least two adjacent cutting tools are linked to form a jointly movable guide frame element.
5. Device according to Claim 4,
characterized in that the guide frame is spring supported.
6. Device according to Claim 4 or 5,
characterized in that the guide frame is formed as a single component.
7. Device according to one of the Claims 3 to 6,
characterized in that the cutting tools each have a wedge-shaped cutting blade defining the cutting outline and the guide frame element assigned in each case has

a window, whereby the cutting blade is formed such that it can move into the assigned window.

8. Device according to Claim 7,
characterized in that the guide frame has at least two adjacent windows which are separated from each other by connecting struts.
9. Device according to Claim 8,
characterized in that the connecting struts of the guide frame are formed as replaceable round bars.
10. Device according to Claim 8 or 9,
characterized in that the connecting struts have a width of 2 to 5 times the thickness of the plastic cards.
11. Device according to one of the Claims 1 to 10,
characterized in that the cutting tools have a cutting outline running round in a rectangle with a longer and a shorter side and the shorter sides of the adjacent cutting tools are aligned parallel to each other.
12. Device according to Claim 11,
characterized in that between two adjacent wedge-shaped cutting blades a groove is formed to incorporate the connecting strut during the cutting process.
13. Device according to Claim 12,
characterized in that the depth of groove is greater than the height of the connecting struts.
14. Device according to one of the Claims 1 to 13,
characterized in that at least one lower and/or one associated upper cutting tool is positioned on a base plate and this base plate has at least one window positioned coaxially to the cutting outline of a cutting tool, whereby the opening

surface of the windows corresponds at least to the surface covered by the cutting outline.

15. Device according to one of the Claims 1 to 14 with a pressure stamp that can plunge into the cutting outline for separating out the cut plastic cards from the sheet or strip material,
characterized in that ventilation is provided for the air present or enclosed between the pressure stamp and the plastic card and that this is formed such that a pressure difference between the pressure of the air present between the pressure stamp and the plastic card during the separation process and the ambient pressure is limited to a predetermined value.
16. Device according to Claim 15,
characterized in that the ventilation to limit the value of the pressure difference to the ambient pressure is formed such that any disruptive influence of the air present or enclosed between the pressure stamp and the plastic card during separation of the plastic card is kept to a minimum.
17. Device according to Claim 15 or 16,
characterized in that the ventilation is formed such that any suction effect from the pressure stamp on moving back after the separation of the plastic card is kept to a minimum.
18. Device according to one of the Claims 15 to 17,
characterized in that the distance between the pressure stamp and the wedge-shaped cutting blade during cutting process is less than the thickness of the plastic cards, and preferably less than 0.3 mm.
19. Device according to one of the Claims 15 to 18,
characterized in that the pressure stamp has a front surface that is in contact with the plastic card during separation and is provided with at least one bored hole open to the front surface to provide ventilation.

20. Device according to Claim 19,
characterized in that the bored holes in the front surface are symmetrical to the longitudinal and transverse axes of the front surface running parallel to the side edges of the front surface.
21. Device according to one of the Claims 15 to 20,
characterized in that the ventilation is provided by a three-dimensional contouring at the front surface.
22. Device according to Claim 21,
characterized in that raised corner areas of the front surface span jointly a conceived area and that side edges in between are set back in relation to the conceived area.
23. Device according to one of the Claims 15 to 22,
characterized in that the ventilation has at least one groove on the front surface.
24. Device according to one of the Claims 15 to 23,
characterized in that the ventilation includes air ducts at the cutting tools.
25. Method for the separation of plastic cards with one of the devices from the Claims 1 to 24 with the following stages:
 - Fixing the sheet or strip material,
 - Cutting the upper and lower side of the sheet or strip material with the assigned upper and lower cutting tools defining the cutting outline, while retaining a residual cross-piece;
 - Pressing out of the plastic cards from the sheet or strip material,**characterized in that** at least two plastic cards are separated forcibly coupled out from the sheet or strip material at the same time.
26. Method according to Claim 25,
characterized in that at least two plastic cards are fixed forcibly coupled, cut forcibly coupled and then pressed out at the same time.

27. Method according to Claim 25 or 26,
characterized in that as the plastic cards are being pressed out, ventilation is carried out which limits any effect of the air movement created by the pressure stamp on the pressing out and the direction of ejection of the plastic cards to a minimum.

28. Method according to one of the Claims 25 to 27,
characterized in that the pressing out of the plastic cards from the sheet or strip material is carried out by means of a peeling movement.